

Atty. Docket 1385.45510VX2  
Application Serial No. 10/087,905  
Office Action dated May 26, 2005

### Remarks

#### **I. Introduction**

By the present Amendment, claims 120-122, 124-126, 128, and 129 have been amended. No claims have been added or cancelled. Accordingly, claims 120-122, 124-126, 128, and 129 remain pending in the application. Claims 128 and 129 are independent.

#### **II. Office Action Summary**

In the Office Action of May 26, 2005, claims 120-122, 124-126, 128, and 129 were rejected under 35 U.S.C. §102(b) as being anticipated by O'Shea et al. ("O'Shea"). This rejection is respectfully traversed.

#### **III. Rejection under 35 U.S.C. §102**

Claims 120-122, 124-126, 128, and 129 were rejected under 35 U.S.C. §102(b) as being anticipated by O'Shea. In support of this rejection, the Office Action indicates that O'Shea discloses a semiautomatic image analysis method to characterize the morphology of dimorphic yeast undergoing alcoholic fermentation of cheese whey permeate. This method allegedly discloses all the steps recited in the claimed invention. For example, O'Shea is cited for teaching measurement of geometric properties of individual, or clusters of, cells in culture. Various examples and results are characterized as corresponding to features recited in the claims. The Office Action also provides citations to various passages in O'Shea that are believed to correspond to the claimed elements.

As amended, independent claim 128 defines an apparatus for identifying a culture medium component that comprises:

means for identifying a predetermined set of test compounds;

means for parameterizing said predetermined set of test compounds by determining at least one parameter for each test compound in said predetermined set of test compounds;

means for performing a space-filling design of the parameterized predetermined set of test compounds to identify a plurality of first test compounds, wherein said plurality of first test compounds is a subset of said predetermined set of test compounds;

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means for constructing a first test library containing a plurality of first culture media, each said first culture media containing a respective first test compound identified using said space-filling design;

means for deriving a quantitative relationship between a measured indicia of a property of said plurality of first culture media and at least one parameter of said plurality of first test compounds;

means for identifying a candidate library containing a plurality of candidate culture media having an estimated indicia that satisfies a test requirement, wherein each said candidate culture medium contains a respective test compound from said predetermined set of test compounds that is not in said first test library, and wherein said estimated indicia is calculated using said derived quantitative relationship; and

means for identifying a second test library containing candidate culture media having a measured indicia that satisfies said test requirement.

According to the invention defined by independent claim 128, means are provided for identifying a predetermined set of test compounds. This could be done, for example, by a researcher, scientist, automated computer/controller, etc. The test compounds from the predetermined set of test compounds are then parameterized through determination of at least one parameter. The parameter can correspond to various properties of the test compounds. A space-filling design is then performed for the parameterized test compounds. This results in identification of a plurality of first test compounds that is a subset of the predetermined set of test compounds. A first test library is constructed to include a plurality of first culture media. Each of the first culture medium contains at least one first test compound identified using the space-filling design. Next, the apparatus derives a quantitative relationship between a measured indicia of the first culture media and at least one parameter of the first test compounds. The indicia can reflect, under certain circumstances, a value for a desired property of the first culture media. According to one or more embodiments of the invention, the relationship can have a mathematical component capable of being applied to other (untested) culture media.

Next, means are provided for identifying a candidate library containing a plurality of candidate culture media. The candidate culture media each have an estimated indicia that satisfies a test requirement. The estimated indicia is calculated using the derived relationship. The candidate culture media are also selected such that their estimated indicia meet a test requirement. The test requirement can be set based on desired properties, characteristics, or

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specific research being performed. Each candidate culture medium contains at least one test compound that is not in the first test library. Finally, means are provided for identifying a second test library including second culture media having a measured indicia that satisfies the test requirement.

As can be appreciated, one or more embodiments of the invention provide a candidate library that contains actual lead compounds expected to have certain properties that the user seeks. This expectation is based on the indicia calculated (or estimated) using the derived relationship. The culture media containing these lead compounds can subsequently be tested to confirm the presence of these desired properties. This can be particularly useful, for example, in situations where a high number of test compounds exist (e.g., peptide identification). It can often be expensive and time consuming to test culture media containing individual test compounds to identify those having desired properties using conventional methods. Thus, the actual number of experiments conducted can be significantly reduced.

The claimed invention can be used, in part, to reduce time and costs by predicting a subset of test compounds (from a very large library of test compounds) that will have the desired properties. Users are able to consider the use of culture media, containing a substantially large group of test compounds, that could potentially have an indicia which satisfies the test requirement. The first test library can then be filtered to a smaller candidate library. A user could then take the compounds identified in the candidate library and conduct actual experimentation to obtain more accurate values for the desired properties for the culture media.

Contrary to the assertions made in the Office Action, review of O'Shea has failed to reveal any disclosure or suggestion for various features recited in independent claim 128. O'Shea discloses a method of characterizing the morphology of a dimorphic yeast undergoing alcoholic fermentation of cheese whey permeate. The method utilizes culture media and various medium components. However, O'Shea does not construct a first test library as set forth in the claimed invention. O'Shea does not parameterize predetermined test compounds by determining a specific parameter for each test compound, and then perform a space-filling design of the parameterized test compounds. O'Shea does not appear to provide a library of first culture media that contain at least one first test compound

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identified by the space-filling design. This is to be expected since no space-filling design methodology is applied. O'Shea does not derive a quantitative relationship between a measured indicia of a property of the first culture media and the parameter determined for the test compound. Rather, O'Shea appears to only measure various properties (such as biomass dry cell weight, lactose concentrations, and ethanol concentrations) using an image processing system linked to a microscope. O'Shea also fails to apply the derived quantitative relationship to estimate an indicia for culture media that contain test compounds not found in the first test library. Measurement of experimental data alone cannot be construed as disclosing specific steps recited in independent claim 128, where the reference is completely silent on these features.

It is therefore respectfully submitted that independent claim 128 is allowable over the art of record.

Claims 120-122 depend from independent claim 128, and are therefore believed allowable for at least the reasons set forth above with respect to independent claim 128. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

Independent claim 129 defines a computer program product tangibly embodying a program of instructions executable by a machine. The program of instructions causes the machine to perform the steps of:

identifying a predetermined set of test compounds;

parameterizing the predetermined set of test compounds by determining at least one parameter for each test compound in the predetermined set of test compounds;

performing a space-filling design of the parameterized predetermined set of test compounds to identify a plurality of first test compounds, wherein the plurality of first test compounds is a subset of the predetermined set of test compounds;

constructing a first test library containing a plurality of first culture media, wherein each of the first culture media contains a respective first test compound;

deriving a quantitative relationship between a measured indicia of a property of the plurality of first culture media and at least one parameter of the plurality of first test compounds;

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identifying a candidate library containing a plurality of candidate culture media having an estimated indicia that satisfies a test requirement, wherein each candidate culture medium contains a respective test compound from the predetermined set of test compounds that is not in the first test library, and wherein the estimated indicia is calculated using the derived quantitative relationship; and

identifying a second test library containing candidate culture media having a measured indicia that satisfies the test requirement.

The program instructions of independent claim 129 corresponds to the acts performed by the apparatus of independent claim 128. As previously discussed, the art of record simply fails to disclose or suggest many of these features.

It is therefore respectfully submitted that independent claim 129 is allowable over the art of record.

Claims 124-126 depend from independent claim 129, and are therefore believed allowable for at least the reasons set forth above with respect to independent claim 129. In addition, these claims each introduce novel elements that independently render them patentable over the art of record.

#### IV. Conclusion

For the reasons stated above, it is respectfully submitted that all of the pending claims are now in condition for allowance. Therefore, a Notice of Allowance is believed in order, and courteously solicited.

If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

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Authorization

If the Examiner believes that there are any matters which can be resolved by way of either a personal or telephone interview, the Examiner is invited to contact Applicants' undersigned attorney at the number indicated below.

Applicants request any shortage or excess in fees in connection with the filing of this paper, including extension of time fees, and for which no other form of payment is offered, be charged or credited to Deposit Account No. 01-2135 (Case: 1385.45510VX2).

Respectfully submitted,

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